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Directions in Music: Stakeholder perspectives on blockchain innovations in music streaming

Introduction

In their draft paper 'How blockchains can support, complement, or supplement intellectual property', the Coalition of Automated Legal Applications (COALA) presents a compelling vision of a digital economy primed to engage with blockchain, a technology that could dramatically improve opportunities for revenue collection and control of digital content and metadata, for creators and intellectual property rights owners:

'We live in a knowledge economy: a world where value creation is shifting away from moving atoms around, to moving bits around' (COALA, 2019).

Now comfortably into its second decade, blockchain technology is part of a broader paradigm shift in the digital commons, where an array of debates, innovations and movements are seeking to reconfigure economic structures; going beyond the challenge of rethinking business design, to engage more fundamentally with issues of wealth distribution and inclusive governance.

This article examines blockchain's relationship with ownership. It explores how blockchain is transforming the way that things are owned, and is contributing to an evolving conception of ownership. Although the opportunity to assess a multitude of cryptocurrency use cases are many and varied, the article focuses on blockchain implementation within the music streaming sector. I take this approach for two key reasons. Firstly, given that the operating parameters of the three platforms are all similar to a large degree - including streaming music, generating income for creators of music-based digital content, and meeting the challenge of engaging listeners in a highly competitive marketplace - then it makes sense to hold each up against the other for the sake of creating a meaningful comparative analysis. Secondly, the focus is on music streaming platforms, rather than, for example, supply chain management, as my own background is in music. Consequently, the three streaming platforms presented an opportunity to not only examine blockchain in relation to governance and ownership, but also to consider these issues in relation to an evolving digital music sector.

Key focus points include the ownership of digital content and intellectual property rights; along with broader matters of governance and digital inclusion, framed as systemic issues relating to access to ownership. Given this multipartite framework, the article draws on stakeholder theory to underpin the analysis; examining blockchain's role in generating new types of stakeholders within a cryptocurrency ecosystem, along with new stakeholder relationships. In what follows, I argue that blockchain, a digital tool that has opened up new business structures within the digital music economy, enables us to understand how familiar notions of ownership are adapting to technological change.

Initially, the article builds on stakeholder theory to examine three approaches to theorising and designing inclusive governance structures that acknowledge the distributed, and at times collaborative, nature of interaction between members of a group; be that a society, a

company or other form of organised grouping. Here I draw on three discourses: (i) John Rawls' concept of Distributive Justice, (ii) a set of principles known as the 'Scandinavian approach to Participatory Design'; and (iii) the emergent concept of 'New Economics', a term particularly associated with current and emergent left-wing political perspectives in the UK. Each share a common view that groups, networks, companies, societies and platforms contain certain tensions that arise from the fact that - whilst the members of a group will often be willing participants and contributors to the main activities of the group - at the same time, individuals will display different needs and objectives. Stakeholder theory provides us with a means to understand how, in Rawlsian terms, such a distributive approach to understanding benefits and value can provide valuable perspectives about developments in the use of blockchain-based cryptocurrencies, and it facilitates a formalisation of non-profit based objectives and networks that make up a firm's *modus operandi* and surrounding ecosystem. Furthermore, stakeholder theory ¹ offers a range of opportunities for recognising and considering the plurality of a firm's commercial activities, along with their non-commercial impacts; often understood as *externalities*.

The analysis then switches focus, examining blockchain in relation to issues of ownership and governance through the lens of three music streaming platforms; Resonate, Musicoin and Choon. All three platforms have leveraged blockchain in their digital systems and in their business design, in such a way as to create platform structures that respond to a set of pressing socio-economic themes: co-operative ownership, a universal basic income (UBI), and the sharing economy. Whilst none of the latter are new ideas as such, they have nonetheless re-emerged and continue to evolve as digital commerce adapts and mutates in response to technological innovation and disruption. As a result, we are able to consider the following stakeholder relationships within the blockchain-based music streaming mix: (i) a platform's relationship with both music producers (as content providers) and listeners, (ii) a producer's relationship with their listeners, and (iii) the listener's evolving role as both passive and active participant within the streaming and wider digital ecosystem.

Context for the article

Deloitte's 2019 Global Blockchain Survey reports that engagement with blockchain is increasing across a widening set of vertical industries and sectors, including 'technology, media, telecommunications, life sciences and health care, and government' (Deloitte, 2019). According to the survey, 'a turning point' in 2018 led to these sectors moving beyond what it refers to as 'blockchain tourism', and instead towards a more comprehensive focus on developing 'practical business applications' (Deloitte, 2019). However, Deloitte and others remain cautious in their outlook as to the scale of both the

¹ This article draws on stakeholder theory as a means to recognise how blockchain has facilitated different types of engagement within the digital ecosystem of a streaming platform. The intention here is not to specifically critique stakeholder theory in terms of the use of blockchain in shareholder management. For an example of how blockchain technology is being used to innovate within shareholder management, see Panisi, Buckley and Arner (2019), and the discussion of e-Residency, a 'blockchain-based voting platform that increases efficiency in voting processes for shareholders of companies listed on Nasdaq's Tallinn Stock Exchange' (Panisi, Buckley and Arner, 2019:23).

current and potential uptake of blockchain as a component of emergent business practices and solutions. Indeed, JP Morgan take the view that whilst 'progress across various sectors is growing', nonetheless, 'widespread blockchain adoption with scalable solutions is at least three to five years away' (JP Morgan, 2019). Similarly, a recent McKinsey article suggests that 'there is a growing sense that blockchain is a poorly understood (and somewhat clunky) solution in search of a problem' (Higginson, Nadeau and Rajgopal, 2019).

Nonetheless, what has clearly changed in the discourse surrounding blockchain uptake is the increasingly focused nature of the analysis and debate. For example, JP Morgan's 'The Next Step for Blockchain' report highlights areas of blockchain engagement, in the form of smart contracts, in 'real estate, IP licensing and auto dealerships', and record keeping, in 'healthcare, financial services and supply chains' (JP Morgan, 2019); suggesting that opportunities to develop and apply blockchain solutions are becoming more widely recognised and utilised. This focusing is also reflected in academic literature. Malherbe *et al* (2019) reflect on how innovations in Litecoin are generating a proof-of-work algorithm that will increase transactions, whilst at the same time lower transaction costs and energy use (Malherbe *et al*, 2019). Similarly, Clark and Burstall (2019) state that 'blockchain is now widely expected to have a transformative effect on IP-heavy industries' (Clark and Burstall, 2019). Allen, Berg and Markey-Towler (2019) put forward their 'predictions for the future of supply chain governance' with regard to ongoing developments in digital commerce. They suggest that further implementation of blockchain-based infrastructures will lead to 'new forms of economic organisation', where coordination between multiple organisations becomes less the work of management hierarchies, outsourcing trust to a distributed ledger instead. In addition, they predict that there will be increased 'shifts in economic power through reductions in information asymmetries', meaning that producers and consumers will have more information about product pricing and supply chains (Allen, Berg and Markey-Towler, 2019: 5). Insights such as these suggest that blockchain's value may yet prove to be infrastructural, and that adaptability and growing interoperability may yet prove to be one of its core strengths. The banker and ex-business journalist Igor Pejic puts forward an analysis of future developments in the banking sector, which sees a combination of blockchain-based fintech companies, and what he terms 'data behemoths' (in other words, the likes of Facebook and Google), as being the site of innovation and long-term development and change for the global banking sector (Pejic, 2019: 99).

ConsenSys, are but one example of a blockchain technology developer who can already count 'Financial Services, Supply Chain, Energy and Natural Resources, Government and Education, Advertising, and Entertainment' among the list of vertical industries that they have already integrated with (ConsenSys, 2018). Indeed, ConsenSys see blockchain's reach as being pervasive, and their ambition for blockchain is that it will come to disrupt, 'Financial Services, Government, Investment Companies, Travel Management, Wholesale and Distribution, Professional Services, Retail, Public Sector, Education and Research, Housing Authorities, Real Estate, Insurance, Non-Profit Organisations, Healthcare and Utilities' (ConsenSys, 2018). ConsenSys' mission 'is to enable that progress by building platforms, applications, and tools for Web 3.0, while offering services to ensure they are useful to our customers' (ConsenSys, 2019). Whilst their aims are admirable, it is telling that ConsenSys are framing blockchain as a component and facilitator of change, rather than as

a prime mover per se. As such, whilst McKinsey may well be correct to question blockchain's capacity to completely rewire the financial services industry, there has clearly been a recent increase in the way that blockchain is being deployed beyond the borders of the fintech sector.

Another important aspect of the Deloitte analysis is their differentiation between 'enterprise organisations' - in other words, companies that have engaged with blockchain, but have only used it to help them do what they already do, but more efficiently - and 'blockchain emerging disruptors', who have built an entire business framework around the affordances of blockchain (Deloitte, 2019). Not only does this provide further support for the idea that the next era of blockchain development may well be around hybridised innovation, it would also seem that what Deloitte describe as 'the second phase of disruption' will be characterised by companies that seek to reinvent their processes in order to capitalise on the opportunities created by blockchain, by embedding it in a strategy is focused on integration with other sectors and companies (Deloitte, 2019). In this respect, Pejic's work also advances our understanding of blockchain's relationship with disruption, and his description of blockchain as a 'competence-destroying' technology (Pejic, 2019: 38) draws our attention to the fact that *disruption disrupts* in different ways. From this perspective, *enterprise organisations* would be seen as being focused on enhancing their established competencies by engaging with emergent technologies, whereas *emerging disruptors* would be directed towards destroying an already-existing competence framework that exists within a given sector. While the trend has often been to think of blockchain in terms of this second category, as a disruptor that could render obsolete, or completely destroy, the systems, processes and advantages of incumbent players within a given market, the situation is far more nuanced than that. Pejic understands technology as being disruptive 'when it alters the lines along which firms compete and create a competitive advantage', which would suggest that defining blockchain as a disruptive technology is dependant 'on the area within which it is employed' (Pejic, 2019: 39).

In relation to this article's focus on digital music commerce, Pejic's analysis is useful, since blockchain is clearly gaining traction in this sector, particularly as an enabler for rights management ². It is worth noting that Pejic does not see blockchain and distributed ledger technology as being capable of creating a techno-economic paradigm shift itself, since it lacks what he considers to be the necessary open-endedness that would allow to create a total system change. For Pejic, blockchain is fundamentally a function of the internet's already-existing digital paradigm, and it is this that will ultimately set a limit on how far and how fast blockchain adoption will develop. Thus, we might be better advised to reconsider the extent to which recent narratives have framed blockchain as an all-conquering disruptor

² See also Gheorghe and Soltanisehat (2018) and their discussion of developments in blockchain-based audio file formats, and Senges (2018), who discusses disruption in music commerce in relation to blockchain-enabled developments in the licensing of digital content.

³, or whether we would be better advised simply to reflect on how its disruptive capabilities are derived from its embeddedness with other actors in a matrix of change.

What has clearly emerged in the discourse surrounding blockchain technology is a shift away from the more hyperbolic language that positions it as a universal disruptor of vertical industries. Instead, there is an increasingly clear focus on how it is that blockchain will achieve these efficiencies as a horizontal enabler *within* various industries. And it is this, more specific and located, deployment of blockchain that informs the approach taken in this article.

Governance, Inclusion, Participation and Ownership

According to Stieb (2009), Edward Freeman's stakeholder theory is concerned with reconfiguring traditional approaches to business, such that benefits and 'important decision-making powers' should be redistributed beyond 'stockholders', to a wider network of 'stakeholders'. Stieb quotes Freeman: 'The crux of my argument, is that we can reconceptualize the firm around the following question. For whose benefit and at whose expense should the firm be managed?' (Freeman, in Stieb, 2009: 405). Freeman's project was concerned with re-evaluating theories of the firm, and in particular challenging the accepted framework of managerial capitalism, by recognising the fundamental importance of a firm's interaction with a network of stakeholders

Elsewhere, Freeman positions stakeholder theory as means of understanding 'value-creation activity as a contractual process among those parties affected; [designating] those parties as financiers, customers, suppliers, employees, and communities' (Freeman, 1994: 415). For Freeman, then, what is at issue here are traditional approaches to understanding the nature of business ecosystems. What he was challenging was the accepted view that firms were fundamentally designed to create value for shareholders. Instead, his approach recognised not only a variegated set of interests in the affairs of a given firm, but also a heterogeneous set of values that would be generated in relation to these different interest groups. Stieb quotes Freeman's call for a given firm 'to interact with other communities that it affects or is affected by, seeking to understand their perspectives, listen to their preferences, and evaluate the impact of actions on them.' Freeman frames this as 'cooperation with those upon whom it relies for support – employees, suppliers and customers' (Freeman, in Stieb, 2009: 405).

Whilst these passages provide us with a clear illustration of what a stakeholder approach might look like in practice, underpinning this is a framework - or 'normative core' - that demonstrates Freeman's more theoretically-informed modelling. Here, Freeman's ideas draw on the work of John Rawls and others, in terms of their 'liberal notions of autonomy, solidarity, and fairness' (Freeman, 1994: 415), and Freeman's 'normative core' of the stakeholder approach - which he articulates as a 'redesigned contract' - is deeply indebted to Rawls' principles of justice. Freeman creates the platform for his theory by first equating

³ Perhaps the best example of the high regard that some hold for blockchain's disruptive capabilities is Don and Alex Tapscott's book, first published in 2016 and reprinted in 2018, *Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies is Changing the World*.

the 'liberal idea of fairness' with a 'basic quality among stakeholders', bestowed upon them in the form of their moral rights in relation to the firm. Secondly, he suggests that a framework of liberal fairness allows for inequalities among stakeholders, provided that these inequalities result in a raising of the level for 'the least well-of stakeholder' Freeman, 1994: 415-6). As we shall see, Freeman's ability to articulate a differential of equality within a stakeholder framework, will prove essential for how blockchain-based streaming platforms are able to offer variegated benefits to platform owners, artists and users.

A Theory of Justice

The central goal of John Rawls' work in *A Theory of Justice* is to acknowledge and facilitate differentials that exist within the social contract that underpins liberal and fair society. Rawls' principles of justice are as follows:

1. 1. Each person is to have an equal right to the most extensive total system of equal basic liberties compatible with a similar system of liberty for all.
2. 2. Social and economic inequalities are to be arranged so that they are both:
 - a) to the greatest benefit of the least advantaged, consistent with the just savings principle, and
 - b) attached to offices and positions open to all under conditions of fair equality of opportunity (Rawls, 1972: 302).

Underpinning this notion of 'fair equality of opportunity' is what Rawls refers to as the 'Difference Principle' (Rawls, 1972: 76). This concept moves away from a notion of 'absolute' equality, where benefits are shared equally across society, and instead towards a differential model, that accepts that benefits can be unevenly distributed. For Rawls, the baseline reference for this distributed, rather than absolutist, approach was that whatever the increases in wealth might be across the social spectrum, there should be some increase for the 'least advantaged'. In short, increases at the top end of a wealth distribution curve are allowable, on the condition that those at the lower end of the scale are not made worse off.

Throughout *A Theory of Justice*, Rawls repeatedly returns to the idea that society results from some form of social contract, albeit an unacknowledged one, and his principles are a reflection of both a tacit acceptance of such a contract, along with an indication of the 'best' form that it could take. Rawls informs us that whilst 'the principles of justice deal with conflicting claims upon the advantages won by social cooperation' (Rawls, 1972: 16), in the final analysis, 'the two principles of justice, however, seem to be a reasonable proposal. In fact, I should like to show that these principles are everyone's best reply, so to speak, to the corresponding demands of the others' (Rawls, 1972: 119). As such, Rawls' unique contribution to theories of the social contract is that - provided gains are not made at the expense of the least advantaged - benefits may be distributed unevenly across the different tiers of wealth within society, meaning that there must always be opportunity for anyone within the social strata to gain advantage.

What is important about Rawls' work in the context of this article is that his principles of justice provide a way to understand stakeholder theory, and - as we shall see later - a means to think about how blockchain-powered streaming platforms enable platforms, producers and consumers to interact as stakeholders. Freeman (1994) specifically aligns stakeholders within a business context with Rawls' differential stakeholders engaged in negotiating a social contract. Whilst Freeman's analysis takes in the broader spectrum of Rawls' theory of justice in order to justify the mechanics of his own theory of the stakeholder, nonetheless, the former does provide us with a particular way of understanding stakeholders as both hypothetical agents that are part of a distributed system of differential justice, and at the same time actual producers, consumers, managers and suppliers.

Scandinavian Approaches to Participatory Design

In the article 'Scandinavian Approaches to Participatory Design', Judith Gregory relates the history of participatory design practices in Scandinavian countries, focusing on both the development of the movement, as well as its overarching goals. For Gregory, 'the participatory design movements in Scandinavia have their roots in post-war political movements striving for industrial democracy including forms of co-determination by unions and 'shopfloor' workers in decision-making and efforts to improve the quality of working life, in the broad context of democratisation of society' (Gregory, 2003). This passage suggests that the movement was not only concerned with improving working environments through collaborative processes, but that the workplace itself was being viewed as a microcosm of society, so that innovation on the 'shopfloor' could be seen as a precursor to more widespread progressive change. Gregory lists the following motivations for the implementation of participatory design:

- improving the knowledge upon which systems are built
- enabling people to develop realistic expectations and reductions resistance to change
- increasing workplace democracy by giving the members of an organisation the right to participate in decisions that are likely to affect their work (Gregory, 2003).

The participatory design movement is also instructive with regard to issues of ownership and governance. Gregory's research demonstrates that by giving workers a sense of ownership over the systems and processes that they encountered on a daily basis, the Scandinavian innovations showed that workplaces, communities and social institutions can be improved by activating the agency of everyone that is part of a given environment. Gregory quotes Pelle Ehn, a leading figure in the participatory design research community: 'In the interest of emancipation, we deliberately made the choice of siding with the workers and their organisations, supporting the development of their resources for a change towards democracy at work.' (Gregory, 2003). What is critical about this perspective is Ehn's commitment to the idea that emancipation and freedom are tethered to involvement and agency, which suggests that 'ownership' can be understood as the capacity to own the process of making decisions, and influence a design process. There are clear echoes here of a stakeholder approach to management and employee engagement, in the broadening out of the decision-making process within the workplace to include employees as stakeholders.

New Economics

Having engaged with two historical examples of theoretical and practical approaches to reconfiguring governance and inclusion, I shall now turn to the more contemporary subject of the 'New Economic Thinking' before offering some concluding remarks.

In 2018, the British Labour MP and Shadow Chancellor, John McDonnell, published the book *Economics for the Many*, the contents of which were a collection of essays that represent an emergent wave of critical thinking that can be captured under the heading of 'The New Economics'. Whilst this article is neither a critique nor an apology for left-wing economic thinking, a number of the book's themes reflect various ideas that have been discussed above.

In 'Democratic Ownership and the New Economy', Guinan and Hanna lay the blame for 'crumbling public infrastructure, social atomisation, uneven development, environmental destruction and a widespread sense of popular disempowerment' at the feet of 'the most powerful engine for the extraction of value the world has ever known', which, in their analysis, is a conglomeration of private interests, banks, global markets and multinational corporations (Guinan and Hanna, 2018: 108). According to Guinan and Hanna, more than 10 million US workers can now be described as employee owners - in other words, members of a cooperative of some sort - a figure that is far higher than current private sector union membership figures. Whilst this shared ownership still appears to be largely located in sectors which are not natively digital - 'urban, agricultural and financial cooperatives, including credit unions' (Guinan and Hanna, 2018: 119) - the chapter shows that digital integration is evolving. What is more, Guinan and Hanna's comments on the capacity of platform cooperatives to offer credible alternatives to 'the depredations of the sharing economy' in the form of 'participatory budgeting and planning', strongly suggest that shared ownership of the means of allocation and distribution is increasing (Guinan and Hanna, 2018: 120-1).

With a similar focus on extractive processes, Standing's essay describes what he calls 'rentier capitalism' as 'the plunder of the commons, pursued by successive governments through privatisation of public land, water, other public utilities, social services and much more' (Standing, 2018: 196). Although Standing does not identify rentier capitalism as an explicitly digital phenomenon, he nevertheless suggests that the 'intellectual property rights regime has fuelled the growth of [the] monopolistic corporations' who are driving this change (Standing, 2018: 196). Standing's work also emphasises the precarity of platforms, data institutions, and indeed the wider economic framework in which such organisations reside. Standing's response to platformisation and the enclosure of the digital commons is to work towards 'a new distribution system [which would come] from dismantling rentier capitalism and from capturing and redistributing rentier income' (Standing, 2018: 201). His programme is therefore directed towards regaining a more tangible public commons, by re-asserting a number of physical (land) and intellectual (digital) rights, and by taxing 'Big Tech's use of our data and metadata' (Standing, 2018: 203).

From Rawls' principles of justice, to the experiments in participatory design, and on to the recent analyses of New Economics thinkers, we can plot a line of development in stakeholder engagement. Freeman drew on Rawls' distributive justice to enable him to reconfigure a broad set of relationships that make up a firm's commercial ecosystem, and Ehn and his colleagues implemented a new, inclusive paradigm for corporate decision-making. Standing, along with Guinan and Hanna, demonstrates that within the contemporary platform environment, ownership - of data and of data platforms - have radically transformed the nature of the stakeholder - and the extent to which stakeholders are intrinsic or extrinsic agents within a firm - and that issues of ethics and remuneration are inextricably bound up in the world of datafied commerce.

Blockchain in context: a hybridised music industry

'Platforms are not just software. They involve the 'stacking' of hardware, software, goods and services, and interfaces into a user experience / marketplace ultimately controlled by one entity' (Meier and Manzerolle, 2018).

Understanding the changing nature of digital music commerce, and recognising how the sector is adapting to technological change is fundamental building an holistic view of the way in which blockchain is contributing to, or is at least part of, a set of wider changes. Therefore, as a precursor to a more detailed examination of blockchain's use within the digital music economy, we shall briefly turn to Leslie Meier and Vincent Manzerolle's work in the article 'Rising Tides? Data capture, platform, and new monopolies in the digital music economy', which offers a series of case-studies and insights into the increasingly symbiotic relationship between the music and information industries.

In their analysis of how Jay-Z and Samsung partnered to release the *Magna Carta...Holy Grail* album in 2013, Meier and Manzerolle examined the extent to which the project was an exercise in 'data-mining' (Meier and Manzerolle, 2018). They concluded that the project revealed that 'the strings attached to free music [are] user data ... [where] music [is] exchanged for compromised user privacy and forced, automated, word-of-mouth promotion via social media' (Meier and Manzerolle, 2018). In addition, and perhaps more significantly in terms of the evolution of the digital music environment, they saw that the project 'offered a decisive step towards embedding music within a platform logic driven by IT interests, testing data-capture-based business models' (Meier and Manzerolle, 2018). Their identification of an underlying systems change and the tethering of these two industrial models of music production and distribution to data capture and analysis, clearly captures one of the huge step changes that has occurred within the music economy has changed in recent times. Whereas previous shifts in the music economy have seen numerous format changes, the assimilation of traditional record companies into media conglomerates - and a trend towards monopolisation which has resulted in the current hegemony of the 'big three' multinationals (Sony BMG, Universal Music Group and Warner Music Group) - Meier and Manzerolle's elaboration of the elision of music commerce with the IT industry enables them to articulate the emergence of substantially new business models and behaviours within what they refer to as the 'digital enclosure' economy. Their analysis of both Jay-Z's collaboration with Samsung, along with Apple's marketing campaign

in 2014 that installed U2's Songs of Innocence 'directly into the library of 500 million iTunes subscribers' (Sherwin, 2014), demonstrates how current practices have engaged in platform commerce in a way that integrates conventional download models with the harvesting of user data (Meier and Manzerolle, 2018).

Meier and Manzerolle go on to discuss Drake's *More Life* playlist release in 2017, describing it as a 'promotional and data event' that combined 'the star- and hit-driven economics of the music industries and the logics of platform accumulation' (Meier and Manzerolle, 2018). What is powerful about Meier and Manzerolle's message in this passage, is that they are able to clearly show how this new form of music commerce has emerged, one that is fully embedded within a digital data framework; this is advanced *datafied* music commerce, rather than simple online sales. In this regard, Meier and Manzerolle's claim that what we might call a 'streaming-as-data-mining' distribution and market research strategy has as yet only served 'to consolidate the fortunes of big media and big tech' (Meier and Manzerolle, 2018), suggests that platformisation of the digital commons has so far been focused on achieving ever-greater asymmetries of wealth (and power) concentration, which is noteworthy, given the misgivings of Standing, Guinan and Hanna in reference to New Economics thinking.

Meier and Manzerolle's work clearly illustrates how data-led disruption has been occurring in the digital music sector over a number of years, within both download and streaming markets, and suggests how developments in digital commerce regularly precipitate more general changes in both content production and consumption habits. In more precise terms, they show that the transformation of music from physical to digital artefact 'highlights the links between marketing, user data, and the use of music as data' (Meier and Manzerolle, 2018), and it this *hybridised* form of music, part entertainment and part metadata, that perhaps best embodies the various vectors in the contemporary digital music economy.

Music and blockchain: perspectives on three start-ups

Given the earlier analysis of trends in blockchain uptake across commercial sectors involved with rights management, Meier and Manzerolle's work suggests that the digital music economy, driven as it is by huge advances in data-mining, will find itself increasingly involved with blockchain-based solutions in data and rights management. As is clear from their report 'Blockchain is here: What's your next move?', PricewaterhouseCoopers recognise that blockchain take-up within the Entertainment and Media industries is small compared to other sectors. For PwC, Financial Services are clearly ahead of the field, and are seen as 'leaders in blockchain' (PwC, 2019) ⁴. However, whilst the take-up might be small, the music industry has nonetheless seen the emergence of a number of innovative approaches to working with blockchain, as demonstrated by the following three examples

⁴ As part of PwC's Global Blockchain survey 2018, in response to the question, 'Which of the following industries are the most advanced in developing blockchain today?', 46% of 600 respondents answered that Financial Services were most advanced, compared to 1% that saw the Entertainment and Media sector as being advanced (PwC, 2019).

of blockchain-based music platforms. What then are the implications and opportunities for making use of blockchain-based ledger technologies in the music sector, and what is the nature of this development and use? The following section examines three music start-ups that are deploying blockchain in various ways.

Resonate: The Ownership of Ownership

'Play fair' (Resonate, 2019). On their home page, Resonate, the blockchain-based music streaming platform, describes itself as 'the community-owned music network', announcing in no uncertain terms that it is a new type of digital music company. A further click onto the 'About' page informs us that Resonate is 'Rewiring the music industry. Resonate is building a new music economy based on fairness, transparency and cooperation' (Resonate, 2019). These are just some of the identifiers that mark the platform out as an 'emergent disruptor', a company that from the outset is exploring, at a fundamental level, the implications of fully integrating blockchain into the design and operation of a digital music start-up. However, although Resonate is integrating blockchain into its business strategy to develop a new type of platform that brings listeners and artists into the revenue mix, their ethos clearly goes beyond a simple interest in bootstrapping distributed ledger technologies within the digital music economy:

- Co-own your platform. Be a part of an active community; share in decisions and in profits.
- Set the terms on which you share. Have a say in how your information is used; decide how to distribute your music (Resonate, 2019).

As these excerpts from the Resonate website demonstrate, the company has a clear ambition to connect with a variety of narratives that run not only across the music sector, but across a much wider set of contemporary debates that address issues such as 'platform cooperativism'⁵, net neutrality and the right to be forgotten. It would seem that the key challenge for Resonate is to establish a digital music service that draws on these ideas so as to facilitate new online structures for commercial and community association, that respond to, and push back on, the incursions of what is variously described as 'platform capitalism', 'data capitalism' and 'surveillance capitalism'⁶, and in ways that reflect the predictions of Allen, Berg and Markey-Towler that were noted above.

The term 'platform cooperativism' was first used by the academic Trebor Scholz in 2014, in an article entitled 'Platform Cooperativism vs. the Sharing Economy' (Scholz, 2014). Scholz

⁵ Among their stated aims, the Platform Cooperativism Consortium (PCC) - who describe themselves as 'a hub for research, community building, and advocacy for co-ops that make the digital transition' - set out their case against 'extractive platforms' and internet giants' who in response to their global data-mining operations, 'offer zero transparency for how this information is used, who it is sold to, and for what purpose'. Their vision includes achieving 'a more democratic digital economy', where 'platform co-ops give stakeholders a say in what happens on the platforms' (Platform Cooperativism Consortium, 2019).

⁶ Whilst this article is not designed to respond to and critique these evolving forms of capitalism, it is nonetheless important to recognise that significant advances have been made in recent years to both understand and formulate practical and conceptual responses to the changing face of digital commerce. The work of Nick Srnicek (2017) and Shoshanna Zuboff (2019) are instructive in this respect.

clearly intended to cause a shift in public understanding and attitudes towards platform disruptors such as Airbnb, Uber and TaskRabbit, who in the early 2010s, were very much in the ascendant. These 'lean platforms' (Srnicsek, 2017) were building new business frameworks and providing seemingly radical alternatives for huge numbers of people to create revenue from their hitherto under- or unexploited skills, resources and time⁷. Also writing in 2014, Nathan Schneider, took a similarly dim view of the sharing economy, writing in 'Owning Is the New Sharing' (Schneider, 2014), that although the lean platforms were seemingly creating a future economy where ownership could be replaced by a culture of renting (to which the euphemism 'sharing' neatly provided a networked, utopian sheen), it was 'becoming clear that ownership matters as much as ever ... whoever owns the platforms that help us share decides who accumulates wealth from them' (Schneider, 2014). Although Schneider's and Scholz's work can now be seen as part of a broader context of discourse that is currently focused on the economic imbalances and asymmetries in the sharing platform model, the concept of platform cooperativism has clearly played a significant role in creating credible alternatives to the standard sharing economy model. In this sense, it is worth considering the breadth of Scholz's vision for 'worker-owned cooperatives' and worker-designed 'apps-based platforms':

'platform cooperativism can invigorate genuine sharing, and it does not have to reject the market ... it can be a reminder that work can be dignified rather than diminishing for the human experience [and] could help to weave some ethical threads into the fabric of 21st century work' (Scholz, 2014).

With such a potent set of ambitions, it perhaps not surprising that platform cooperativism has arrived at the door of the music industry in the form of Resonate. The company describes itself as 'a multi-stakeholder co-operative comprised of three different roles: musicians, fans and the people who build it' (Resonate, 2019b). The cooperative's profits are initially top-sliced by 30% (where 20% is set aside as a contingency fund and 10% is used to pay the interest for 'Supporter Shares'; a particular category of membership within Resonate's cooperative model), and the remaining 70% is split between musicians (45%), listeners (35%) and workers (20%) (Resonate, 2019b). Thus, Resonate's manifesto and terms of reference make it abundantly clear that in almost every way, it is a project that is designed to disrupt traditional forms of digital music commerce from the outset. Although platform cooperativism is a phenomenon that is not necessarily native to blockchain, it is however, an area where blockchain, and its attendant capacity to support immutability, transparency and anonymity, is able to offer a range of compelling solutions for those wishing to build commercial and not-for-profit projects within this area.

'Support the artists you love. What takes other services 200 plays, we do in 9 with stream2own' (Resonate, 2019). This statement is benchmarked against a calculation that is familiar to many in the music industry, whereby the sale of one copy of a typical ten-track album, is seen to be equivalent to that album being streamed 1500 times; making the

⁷ In *Platform Capitalism*, Srnicsek describes lean platforms as businesses that 'operate through a hyper-outsourced model, whereby workers are outsourced, fixed capital is outsourced, maintenance costs are outsourced, and training is outsourced. All that remains is a bare extractive minimum - control over the platform [of software and data analytics]' (Srnicsek, 2017: 76).

purchase of a single track, equivalent to 150 streams (Sisario, 2018). Resonate references this nominal figure of 150 streams in its 'Deep dive on stream2own', with the result that artists using its platform stand to receive payment far more rapidly than with conventional approaches to calculating streaming-based payment schedules⁸. The stream2own system scales listener engagement in a way that recognises a change in listening behaviour between casual listeners and those that are more committed. The 'deep dive' (which appears not to have been updated since 2015), informs us that a first stream costs 0.002 credits. Then, via a process that doubles payments with every play, a ninth and final stream which costs 0.512 credits results in the listener to 'owning' the track. According to Resonate's figures, if a track that is streamed and bought in this way for 1.022 credits (which at current pricing equates to €1.25), goes on to receive 100,000 plays, this would generate \$1526 for an artist, whereas a 'competitor' would only pay \$600, a difference of \$926 (Resonate, 2019a)⁹. In this scenario, Resonate would not only be paying an artist more quickly than other music streaming platforms (after 9 rather than 150 streams), but the payments would be higher (Resonate, 2015). Clearly ownership is an important component in the Resonate model, and part of the company's 2019 relaunch that centres on 'scalability and sustainability [and a] fair-trade streaming alternative' (Devlin, 2019), but it would appear that blockchain is only part of a bigger mix of values and technologies that combine together to inform and facilitate the Resonate model.

Company founder Peter Harris explained that the platform uses Ethereum smart contracts to send payments to artists, suggesting that 'there will be a definitive record of what gets played and what gets paid' (Harris, 2017). However, Harris was clearly aware of the limitations of using blockchain within a music platform, and qualified this statement by saying that 'distributing micropayments to artists is not really feasible, because the vast majority are not using cryptocurrencies (Harris, 2017). For Harris, there was clearly a tension between blockchain's purported capacity to facilitate clean, immutable, and automated rights management and payment systems, and scalability, which remains problematic in terms of providing a fully-functional service. In simple terms, it would seem that the challenge for Resonate has always been to create a technological framework that can track and process such huge quantities of information.

Although much of what Resonate has set out to achieve has been driven by the company's commitment to superseding the siloing of data which it sees as being an inherent part of the platform monopoly system, BigchainDB is not simply an enabler of this vision. According to the BigchainDB 2.0 Whitepaper, 'BigchainDB is software that has blockchain properties (e.g. decentralisation, immutability, owner-controlled assets) and database properties (e.g. high transaction rate, low latency, indexing & querying of structured data) (BigchainDB, 2018), which suggests that two of Resonate's central offers to artists - namely

⁸ Although this figure was amended in 2018, and two new ratios introduced (1250 for subscriber streams and 3750 for ad-supported streams (Sisario, 2018)), even against 125 streams, Resonate's model still offers a more efficient and attractive payment system for artists.

⁹ Resonate contextualise this figure, describing it as an average based on 'exhaustive research' into royalty payments made by Spotify, Apple, Tidal and YouTube. The conclusion is that 'with YouTube on a miserably low end, Spotify and Apple in the middle and Tidal on the high end, we end up with a basic average of \$.006 per-stream by comparison' (Resonate, 2019a).

the ability to 'have a say' in how their data is used, along with rapid payment schedules - are the result of BigchainDB's underlying operating principles. More specifically, BigchainDB set out how it underpins Resonate, informing us that 'it's possible to build a database of artists and songs, track who listens, and set up cost-effective micropayment channels so that artists can be rewarded and listeners can show their love' (BigchainDB, 2020).

Both Harris and BigchainDB also reference the COALA IP protocol, which we encountered at the beginning of the article: 'a community-driven standard for licensing intellectual property' (BigchainDB, 2020), which provides the legal framework within which Resonate and BigchainDB are operating. COALA present us with a familiar set of concerns about the unfair treatment of musical artists and digital content producers online, listing the unfair treatment of 'content creators', in terms of the disparity between the value that original content brings to a platform - 'what keeps these sites filled with traffic-driving content' - and the financial rewards given to creators, where 'more money goes to the distributors than to the creators' (COALA, 2019). What makes COALA's approach noteworthy, is that they also take into account various aspects of the platform experience from a user's perspective, including how listeners 'are surveilled and served ads based on their data profiles' (COALA, 2019). Whilst these issues may be familiar, it is COALA's approach to developing solutions that is perhaps more novel, or at least more future-oriented; with its focus on forming new kinds of alliances between key industry players, and exploring how blockchain can facilitate their ambitions and proposed solutions:

'The COALA IP group is collaborating to design and implement a free and open specification for representing and licensing intellectual property. COALA IP's goal is to establish open, free, and easy-to-use ways to record attribution information and other metadata about works, assign or license rights, mediate disputes, and authenticate claims by others. We believe there should be a global standard at the data level, without the need for centralised control (COALA, 2019).

What is interesting about the COALA position is that it defines a solution to the problem that Harris and Resonate have identified in the world of digital music. Although Harris has now moved on from Resonate, the 2017 interview tells us that he was not only aware of some of the central challenges facing a blockchain-based music platform, but that he also understood what the potential solutions might look like. For Harris, the task for Resonate was not so much about building and running 'a decentralised, distributed database like Bitcoin for metadata and for licensing', instead he realised that the core challenge was to achieve functional interoperability across data-driven platforms: 'you want to have those qualities and characteristics so that you can show that you're not creating another central data silo, but it doesn't have to go as far as something like Bitcoin' (Harris, 2017). If the ultimate solution to the problems facing a digital music economy is to create an infrastructure and a toolset that can facilitate access and analysis of data across digital platforms and networks, then we arrive at the curious conclusion that the problem that Resonate have been working to address concerns the ownership of ownership. Put another way, if, as Meier and Manzerolle show, monetisation of digital commodities and the profitability of music content are increasingly derived from a platform's capacity to own, control and manipulate data, then the Resonate project indicates that that the next wave of

innovation and disruption may well occur at the level of platforms design and implementation, in other words, what next for the 'ownership of ownership'.

Ultimately what this examination of Resonate and its network of partners suggest, is that these issues of data ownership, platform-user agency and the associated challenges of scalability and speed, are very much part of a complex of economic and technological transformation. As Igor Pejic suggests, blockchain is being folded into a disruptive matrix of technologies, strategies and behaviours, and whilst it might not be the change agent, the Resonate perspectives suggest that blockchain is playing an important part of in the process of change. Unlike the McKinsey view that blockchain is a solution in search of a problem, Harris and his colleagues at Resonate and BigchainDB appear confident that blockchain will eventually help them to accomplish their goals, which in many ways reflect Allen, Berg, and Markey-Towler's ideas about outsourcing trust, the guise of interoperability, and the redesign of digital organisations, particularly in the context of stakeholder benefits such as increased transparency.

Musicoin: Sharism, UBI and Making \$MUSIC

Musicoin describes itself as 'a music streaming platform built on the blockchain that supports the creation, distribution and consumption of music in a shared economy' (Musicoin, 2019). As we shall see, sharing, or more specifically the neologism 'Sharism', is central to ideology and operating principles that have informed Musicoin's design. The company's founder, its 'Chief Architect' Isaac Mao (Musicoin, 2019), defines Sharism within the context of the Web 2.0 paradigm, which, throughout the early twenty-first century, catalysed the mass production and sharing of media content by facilitating widespread access to digital production and distribution tools. During a 2010 interview about Sharism, Mao expressed the view that 'people would like to share their content online, not only based on their interests but also based on their instinct about the return of sharing, because [...] whenever you share you can see the consequences of your sharing: the results and the cascade effect of what you're sharing' (Mao, 2010). In effect, Mao's philosophy - which manifests as the principles that underpin the Musicoin platform - understands that content creators do indeed want to share their content, and at the same time acknowledges the multiple value streams that digital content both contains and creates. Whether we couch non-royalty values in terms such as reputation economy ¹⁰, or network effects ¹¹, it is clear that Mao's approach is focused on capturing and to an extent, controlling the way in which

¹⁰ There are many ways to describe the way in which networked digital communication and social media have transformed value, and Isaac Mao's reference to the importance of Social Capital reflects a now long-established view of the notion of a 'reputation economy':

'The reputation economy is an environment where brands are built based on how they are perceived online and the promise they deliver offline. It's a marketplace where professionals are treated like products, and are rated, commented on, and judged based on reputation' (Schwabel, 2011).

¹¹ The concept of Network Effects suggests that platforms and networks become more dynamic and effective due to positive feedback loop effects. In other words, whilst it may be difficult initially for a new platform to gain public and commercial support, once its use goes beyond a small number of early adopters, then its take-up and use will increase exponentially.

music as digital information has a multivalent, and often exponential existence both within and beyond a streaming platform. In simple financial terms, whilst there is clearly money to be made from royalty payments for online plays, there are also myriad opportunities to indirectly generate rewards - both financial and otherwise - from music in a digital context.

In this regard, Mao frames the indirect gains from music-as-data within the context of what he describes as social capital, saying:

'Sharism is based on the respect of people's property and their rights, [it] is totally individualised; [it's] individualism-based. And people would like to share, because they see that if they share, they can connect people [and] people will trust them, and people will relay their *sharing works* and they will keep collecting their social capital' (Mao, 2010).

Sharism therefore means that Musicoin leverages blockchain technology in a very particular way, with the platform claiming that its 'Pay Per Play (PPP) smart contract is the first of its kind in the cryptocurrency space and is designed exclusively with the interests of musicians in mind' (Musicoin, 2017). The practical consequence of this is that Musicoin not only pays artists for streams that accrue on the platform, but also uses metadata in such a way that enables artists to grow their networks and drive more traffic to their content. It would seem that the needs of content producers are clearly at the forefront of the platform's design here, and creators using Musicoin's services are able to 'retain full ownership of their content' (Musicoin, 2017, meaning that rewards pertaining to intellectual property and the digital music artefact's attendant metadata are all directed towards artists, rather than split with the platform. This is achieved in two ways, firstly via a proof-of-work mining process for the Musicoin \$MUSIC token, and secondly by using this mining process as the point of wealth creation and distribution, rather than through advertisement or subscription fees. The Musicoin smart contract process executes the terms of their artist licence with each play, rewarding artists in \$MUSIC 'within seconds' of a track being played (Musicoin, 2017).

Although Sharism is Musicoin's guiding principle, in terms of our wider project of exploring ownership models, it is the way that Sharism plays out in its specific implementation within the Musicoin ecosystem that is important. As with other voices within the blockchain space, Musicoin are keen to assure its users that one of the reasons that their rates are so high, and are paid with such speed, is that 'no intermediaries are required to facilitate payments other than the ledger of the Musicoin blockchain' (Musicoin, 2017). This fee-free payment model works by implementing a cryptocurrency mining process in the following way. Musicoin use what it refers to as a 'UBI Pool' to aggregate and distribute financial rewards. As with Isaac Mao's re-versioning of Social Capital and Sharing Economics, Musicoin also presents its own definition of UBI (Universal Basic Income), in order to support its vision of wealth redistribution. The whitepaper tells us that, 'in Musicoin v2.0, we are introducing a revolutionary new concept in cryptocurrency, "Universal Basic Income (UBI)". UBI is an economic model to ensure each contributor to the platform is fairly rewarded in proportion to their contribution' (Musicoin, 2017) ¹². Whilst it is important to recognise some creative

¹² Musicoin's tethering of fair reward to a proportion of an artist's creative contribution, diverges significantly from a more standard definition of UBI. For example, the *Royal Society for the encouragement of Arts, Manufactures and Commerce* frame a UBI as something that provides 'every individual with a foundation of a

licence and modification of the UBI concept on the part of Musicoin, nevertheless, there is clearly an attempt here to imagine a payment system that is not pegged to either a subscription deal for listeners, or a reward system that is based on payments to artists that are generated beyond the blockchain. More on the Musicoin UBI:

'You're probably wondering how our platform is both free for listeners, and at the same time pays musicians better than any streaming service currently available. *We accomplish this by leveraging the blockchain to remove intermediaries and implementing a model called Universal Basic Income (UBI) that supports both listeners and musicians*' (Musicoin, 2019) (italics added).

There are two important issues here. The first is that whilst a pay-per-play model is not a UBI in the standard sense, it nonetheless shows that Musicoin and Isaac Mao are using blockchain to explore business models and emerging governance processes that look beyond current forms. The Musicoin UBI model works 'to secure musicians' income from PPP on the platform, at a fixed rate that is fair, uninfluenced by market forces and higher than that of any other competing streaming platforms' (Musicoin, 2019). This suggests that a key focus for the company has been on using blockchain as a means to deliver a payment-no-matter-what principle; an approach that recognises some of the difficulties relating to payments that face musicians that we have seen Resonate engaging with. Musicoin go on to say that 'unlike other streaming platforms, users on the Musicoin platform will be able to stream songs for free and without ads' (Musicoin, 2019), a feature that demonstrates an understanding of changing attitudes towards the capture and use of users' personal data.

Secondly, whilst Musicoin describes its business strategies and ideologies in terms of the ethically laudable concepts of UBI and Sharism, the platform is in fact simply basing its payment systems on a different form of value creation, one that is native to the cryptocurrency sector. As with Bitcoin, the value of \$MUSIC results from its pre-programmed scarcity (in other words, only a finite amount of \$MUSIC will ever be produced), alongside the difficulty of the mining process (that is to say, proof of work). Musicoin operates on the assumption that within a socio-digital network, value can be generated and shared in a number of ways, including the simple notion that with increased traffic and platform use, the value of the platform and its features can radically increase. Therefore, provided the underlying cryptocurrency is seen as being a worthwhile investment of its miners' time and effort, then music can be made freely available for listeners to stream on the platform. However, although Musicoin implements the Bitcoin model of pre-programming scarcity in order to create token value, this approach may be ill-founded. Writing about the problems that are caused when objects with inherent value, such as precious metals and cryptocurrencies, are mistakenly used as money, the social scientist Mary Mellor, argues that 'the original aim [for cryptocurrencies] had been to create a neutral currency to enable trade, bitcoin and similar cryptocurrencies morphed into commodities

regular, unconditional, cash payment' (Painter, 2019). Similarly, a preliminary report for the Finnish Government, produced as a precursor to the experimental roll-out of a Universal Basic Income during 2017–2018, sets out a UBI as a 'basic income [that] is paid to all individuals aged 18 and over but not to pensioners (old-age pensions, disability pensions)' (Kirjoittaja ja Kela, 2015: 43).

that were bought as financial investments (Mellor, 2019: 122-23). What Mellor's work suggests is that the value of transactions on platform like Musicoin (in other words payments made to artists via its UBI protocol) will always be at the mercy of the \$MUSIC token's speculative worth as a tradeable commodity. As a result, any artist wishing to use the platform for financial gain is not only putting their faith in the platform's ability to succeed as a business in the competitive and often unrewarding music streaming market, but also in \$MUSIC's success as an asset with a fluctuating market value.

Whilst it is important to acknowledge some of the inconsistencies and potential shortfalls in the Musicoin rationale, its approach to constructing a UBI mechanism is noteworthy nonetheless. The Musicoin mining process creates a new block every 15-30 seconds, and within each block there are 314 \$MUSIC coins. The whitepaper states that 'Of those 314 coins, 250 coins (~80%) will go to miners and the rest of 64 coins (~20%) will go into a common UBI pool. Of those 64 coins in the UBI pool, 50 coins will be reserved for PPP for content streaming on the platform and the remaining 14 coins will go towards platform development' (Musicoin, 2017). This breakdown clearly shows that value within the Musicoin ecosystem is based the mining of currency blocks, rather than tethering value to musical artefacts per se. As of 2019, according to two exchanges, CoinMarketCap and CoinGecko, \$MUSIC is currently valued at \$0.000219 US Dollars (CoinMarketCap, 2019 and CoinGecko, 2019). With the UBI pool apportioning 78% of the 20% of mined coins to musicians' royalties, the whitepaper was confident that 'Pay Per Play (PPP) income for musicians will still be higher than current industry standards, at a peg above 0.02 US cents per play' and that 'at the minimum peg, a musician can earn as much as \$20,000 USD from 1 million playbacks' (Musicoin, 2017) ¹³.

¹³ At the time of the whitepaper's date of publication in 2017, Musicoin's figures were taken from a 2017 Digital Music News report which showed that royalty rates were as follows:

STREAMING PLATFORM	UNSIGNED ARTISTS	SIGNED ARTISTS
Musicoin	\$0.0200	\$0.0200
Apple Music	\$0.0064	\$0.0073
Google Play Music	\$0.0059	\$0.0068
Deezer	\$0.0056	\$0.0064
Spotify	\$0.0070	\$0.0044
Pandora	\$0.0011	\$0.0013
YouTube	\$0.0006	\$0.0007

(Musicoin, 2017)

Having looked at the breakdown of payments within its UBI model, we can now briefly turn to what Musicoin refers to as its 'Musiconomy':

[The Musicoin] ecosystem, also known as Musicoin Economy or Musiconomy, is built as an economic network that fosters the distribution of fair value to different participants based on their contribution in the network – miners for providing computational work (during Proof-of-Work); musicians for publishing their creative work; Musicoin developers for innovating the platform; third-party developers for increasing the value of the platform by creating value-added goods and services, and ultimately consumers for consuming and sharing content and services on the network' (Musicoin, 2017).

Musiconomy is thus a means to understand the digital music economy as a hybrid matrix of actors that includes miners, songwriters, platform engineers, session musicians, producers, publishers and indeed, listeners: the Musicoin stakeholders. As we have already seen with its ambition to embrace new models of payment and platform governance, this passage clearly demonstrates Musicoin's understanding of the way that work is being reconstituted within the digital platform economy, and it is particularly noteworthy to see an acknowledgement of the value created by listeners. Where Meier and Manzerolle presented us with the notion of the hybrid music artefact, it may well be that Musicoin's key contribution to the debate about ownership, governance and distribution is this concept of the Musiconomy; where rewards, values, and a set of labours associated with production, mining, curation and sharing are all intermingled to produce a means to interpret and navigate platform economics.

Despite the fact that Musicoin's design is informed by a degree of creative interpretation with regard to notions of sharing and universal wealth redistribution, this analysis does offer a number of insights into the way that blockchain is being used to define, harness and facilitate new forms of co-production in the platform economy, and suggests perspectives

An updated report for 2019, with figures generated in December 2018 is as follows:

STREAMING PLATFORM	Pay per play rate as of December 2018 (Sanchez, 2018)
Napster	\$0.019
Pandora	\$0.01682
Tidal	\$0.0125
Apple Music	\$0.00783
Google Play Music	\$0.00676
Deezer	\$0.00624
Spotify	\$0.00437
Amazon	\$0.00402
YouTube	\$0.00074

(Sanchez, 2018)

for the broader issue of ownership. Musicoin is not running a UBI model in the strictest sense, and the decision to replace user payments for an artist's creative labour with a share of the rewards for crypto-mining labour has not made music 'free' as such. Instead, the value of music is now part of a Musiconomy matrix that includes the value of a cryptocurrency token. In this sense, the platform is a compelling analogue of the changing face of digital commerce, and Musicoin's success will involve a recognition on the part of users, musicians and miners that they are all powerful stakeholders, contributing to, and to a degree owning, the platform's success. Such an integration of trust and engagement illustrates the extent to which a symbiotic relationship is evolving between token, platform and musical content, where musicians, listeners *and* miners are clearly invested in more than just the music. In short, what Musicoin shows, is that blockchain is facilitating this innovation at the platform level, bringing a network of agents together to give a range of value to the hybrid commodity, along with the platform itself.

Choon, NOTES and streaming-as-mining

The third and final platform that I want to examine is Choon, 'a musical and digital content ecosystem designed to solve some of the music industry's most fundamental problems' (Choon, 2019). As we can see from the preceding engagement with Resonate and Musicoin, the arrival of blockchain in the digital music economy has led to developments in familiar, as well as less familiar, narratives. Although during the writing of this article, Choon ceased trading, there is much that can be learned from this platform, and - as we shall see in the conclusion - its successes are now being redirected into the development of new services.

In terms of the 'fundamental problems' that Choon was designed to solve, co-founder Bjorn Niclas wrote that artist income was a key concern: 'Choon is currently paying 13 times more per stream than Spotify', and that 'getting more money to the artists, faster payments, and a fully transparent royalty accounting system' (Niclas, 2019) was also a high priority. As with Musicoin, the Choon payment system was based on a cryptocurrency mining process, one that produces NOTES, an Ethereum-based token. According to the Choon whitepaper, only two billion NOTES could ever be mined, and in the first five years of the platform's existence, 375000 of these were to be mined and shared with artists every day, in proportion to the number of streams each artist receives. This figure had been projected to decrease over the following five years, until after ten years, 50% of the two billion possible NOTES will have been given to artists (Choon, 2018). While similarities to the Musicoin UBI model are certainly apparent, it is important to note that Choon only saw this token distribution process as part of its initial development phase, and see longer term sustainability as being linked to a range of income sources.

Choon described the above as 'streaming-as-mining', a strategy designed to catalyse the valuation and growth of both the platform and the token. As with Musicoin, the logic of network effects underpinned this approach, which envisioned greater user and listener engagement driving up streaming numbers, and therefore the value of cryptocurrency token. In the longer term, Choon had seen the streaming-as-mining process being replaced by external income from subscription packages and advertising revenue (Choon, 2018),

which is interesting, since it suggests that Choon did not view a blockchain system as a solution for streaming services *tout court*, but as part of a blend of traditional and emergent processes.

Along with these experiments in payment systems, Choon used blockchain to innovate in two other important areas that relate directly to the broader evolution of ownership: listener payments and artist control of metadata. With regard to listener payments, not only could listeners use the NOTES token to buy music, they could also be rewarded in NOTES for 'creating popular playlists, listening to promoted songs [and for] providing useful comments and community feedback' (Bein, 2017). As the Musiconomy model demonstrated, listeners can add considerable value to music in the digital domain, and Choon had harnessed this in two ways: by 'Curating Monetised Playlists', and by 'Listening to Promoted Tracks' (Choon, 2018). Choon viewed playlist curators as 'valuable stakeholders in the online music world', and once a musical artist had agreed to have their track placed in a playlist, a curator could earn 5% of income that results from the playlist being streamed. In addition, artists were able to target listeners as part of a track's promotional campaign (basing their targeting on familiar details relating to listener preference and location), which could result in a listener being paid to stream the track once. This second feature is noteworthy for two reasons. Firstly, it recognised the promotional work that listeners already do for streaming services and artists, when they listen to, and repost a track that they have enjoyed. Secondly, it demonstrated that Choon was exploring how to make metadata more useful to its artists, by allowing them to target their own listeners directly.

With regard to artist control and autonomy, under the headings 'Freedom to Remix', 'Ecosystem Participation' and 'True Free Market', the Choon whitepaper detailed a series of opportunities for registered platform users to engage with and make use of their digital content and its attendant metadata (Choon, 2018). 'Freedom to Remix' enables artists to 'preauthorise' the remixing of their tracks by other musicians, and also set how much revenue a remix can generate. 'Ecosystem Participation' took what could be described as a 'musiconomical' approach to working with stakeholders, and included the afore-mentioned listener engagement strategy of paying curators and targeted listeners. In addition, artists were able to tip 'superfans' and crowdfund 'up-and-coming artists' (Choon, 2018), which took the notion of musiconomy even further, by recognising some of the highly-nuanced ways that music-listener interactions can occur within a social media network. The 'True Free Market' model was designed to allow artists to scale their prices in relation to their audience, and should an artist have developed 'a small but dedicated fan base willing to pay a larger amount to download his or her music' then there was the option to benefit from that (Choon, 2018). Choon also enabled artists to offer 'limited-edition blockchain collectible editions', which again gave the option of appealing to niche fans, by presumably exploiting blockchain's watermarking function.

Out of the three case studies, Choon's fine-grained harnessing of the myriad relationships within the blockchain platform's ecosystem resonates most strongly with stakeholder theory. Whilst the platform's core aim was to generate revenue for artists from streams, its design recognised multiple indirect methods of achieving this outcome, that at the same time reward listeners in a number of ways. Writing, writing in 2019, Niclas, was confident that the

platform had already begun to disrupt 'the legacy system that was built at the dawn of the early 20th century (i.e., publishing and signing away your rights), that was dominated by the "big six" major record labels that are still at play present day' (Niclas, 2019). With its focus on facilitating user autonomy in relation to digital content and metadata, along with its experiments with a mining-based payment system and the commitment to providing swift payments for users, the Choon platform did begin to explore some of the possibilities that blockchain has offered up to digital commerce. As this article was being finalised, Bjorn Niclas, now CEO and Co-founder of ROCKI, announced the arrival of a new music streaming platform, describing it as 'the first hybrid user-centric blockchain music streaming platform aimed at independent artists and their fans' (Niclas, 2020). He goes on to explain that ROCKI was developed with artists who had previously used Choon, among other similar services, to 'create a platform that allows them to connect directly with their fans' (Niclas, 2020), which suggests that there is more innovation and development to come in the blockchain streaming space.

Where Musicoin has developed a language to describe what a blockchain-based platform can do, Choon has begun to implement a musiconomy model, and whilst neither have fully embraced the platform cooperative model in the way that Resonate have done, each has developed a hybridised payment system that bootstraps a cryptocurrency mining approach, whilst recognising that this may not be a complete and sustainable solution. As these case studies indicate, ownership in the digital music economy is less a question of owning a musical artefact, and more about owning not only the information that surrounds it, but also the mechanism that is used to capture, process and act on that information. It is in this musiconomical intersection that blockchain has found employment, enabling these music start-ups to build new forms of user agency and cooperative forms of governance into the hybridised digital music landscape.

Conclusions: platforms and stakeholders

Although Freeman's development of stakeholder theory largely reflected his interest superseding then-incumbent approaches to corporate management, when we think of the baseline reference point for stakeholder theory - Rawls' principle of distributive justice - we see that 'stakeholders' are an appropriate and useful way to understand various aspects of a business' ecosystem. As we saw with the discussion of participatory design, where the acknowledgement that successful governance and worker engagement went beyond simple financial agreements, the Scandinavian model recognised that it is not simply the working environment, but businesses themselves that can benefit from a whole-organisation involvement of stakeholders in a development and solution process. In this regard, what is interesting about the concept of a 'Musiconomy' is that it frames how businesses, workplaces, and indeed platforms – in other words production infrastructures – can be efficiently designed and produced via a participatory, bottom-up process. Judith Gregory suggests that participatory 'practices are not distinguished by particular methods but by political commitments to societal concerns and relationships with participating users and communities' (Gregory, 2003), and in this respect, the notion of *producing the production line* is redolent of the Scandinavian perspective. However, this sense of inclusivity - which suggests that greater involvement can produce greater autonomy with regard to

strategising the use of metadata - also reflects the Resonate strategy to increase cooperative ownership of data within its platform. The Resonate manifesto informs us that 'Co-ops are the future of an equitable internet. Technology should benefit all involved, not just a handful of shareholders' (Resonate, 2019c), and it is this underlying principle of providing access and control of user data to platform users themselves that Resonate references in its various manifesto statements, and which finds expression in the decision to create a transparent, and scalable, platform structure.

The intersection of Rawls' sense of a social contract and the blockchain platforms' musiconomy models, also enables us to draw conclusions about ownership. A blockchain musiconomy acknowledges that different agents within a platform create different types of value for different aspects of the platform. As such, while it is easy to understand that musicians create content, miners create tokens, listeners create streams, a more nuanced approach allows us to see that musicians can also create payments, listeners can also create promotional materials, and miners can also create value by buying and selling tokens on currency exchanges. Again, the Resonate and Choon models demonstrate how this is quite literally being folded into an emergent model of ownership, whereby platform users and owners are able to access and manipulate their metadata (in the case of Choon), and co-owners are able to control their data and gain reward as the platform grows (Resonate). In this sense, ownership is part of a socio-digital contract with a platform, that sets not only the specific rules and terms of engagement for platform use, but also defines a context within which platform users and contributors can expect to participate. Moreover, each of the blockchain platforms' commitment to giving musicians greater control of their own data, goes hand-in-hand with securing long-term futures for themselves.

As shown in the three case studies above, all three steaming platforms foreground the dynamic interplay between stakeholders in a notably broad sense: technologists (the miners and platform developers), musicians and listeners (again, the musiconomy model), all couched within frameworks that reflect different outcomes and rewards across the stakeholder network. In this regard, there is much that can be learned from Scandinavian participatory design in terms of its whole-systems ethos, which 'emphasise[s] not only technological change and systems development, but change and development of people, organisations, and practices' (Gregory, 2003). In the same way that the Scandinavian movement was based on a core understanding that changes in one component of a system can create change in other components, the three platform innovations exemplify a similar systems-thinking approach. Not only has blockchain's insertion into the music platform economy changed the way that music is monetised and valued, it has begun to alter the nature of the content creator and the listener (to platform owner and music promoter), and as we have seen, blockchain has considerably extended the definition of music as a hybrid digital artefact.

The principles and ideas that underpin the New Economics reveals that current threats to public infrastructure and economic equality caused by monopolisation and wealth extraction are often new forms of long-established challenges, understood by the likes of John Rawls and Pelle Ehn, but now amplified by the speed and reach of evolving and emergent digital tools. Guy Standing's work addresses not only the financial exploitation of

data that results from the conjoining of the information industries with other private and publicly-owned sectors and services, but it also foregrounds two types of precarity that result from data monopolisation and data asymmetry, where control and exploitation of an individual's intellectual property - in the form of their metadata - rest with platform owners. Standing's focus on rentier capitalism, data siloing and information asymmetry goes beyond the bounds of the music sector, but his position is reminiscent of Meier and Manzerolle's conclusions about the hybrid nature of new music economy. Whilst Standing suggests using taxation to resolve these imbalances, the Resonate approach is to use blockchain as a means to implement cooperative ownership. As already noted, Musicoin's idiosyncratic modelling of UBI is problematic, but again, it demonstrates an awareness of the importance of effective data management. In this sense, the microcosm of a stakeholder network within a streaming platform ecosystem provides a useful dramatisation of a number of the issues that Standing raises in regard to the effects of information asymmetry on workers, platform users, and the ownership of public data.

What Rawls showed, and what we can clearly see in the context of the New Economics debates - particularly in Standing's essay where he discusses 'supplicants, atavists and disenchantment' (Standing, 2018: 199-200) - is that an equitable economic model functions on the basis of a distributive principle, one that allows for differential re-valuing, and re-thinking, of shared resources. Decision-making, autonomy and the ownership of rights in the form of data and metadata are crucial components of an emerging economics. Ownership has changed in multiple and significant ways, in terms of our ownership of products, of our intellectual property, and the way that we own a stake in the platform infrastructures that surround, contain and enable these evolving forms. As this article has demonstrated, although blockchain might not drive the next digital paradigm shift, it is by no means merely a solution in search of a problem, given that it has the capacity to deliver a variety of services within the still-evolving stakeholder framework of a streaming platform.

To finish, I want to turn briefly to John Boatright's idea of 'Moral Markets', in order to frame one of the most important messages that we can take from this analysis of blockchain' deployment within the music streaming sector. Boatright's work has been used in a number of analyses of Freeman's work on stakeholder theory, including Freeman (1994) and Cohen (2010), and indeed, Boatright's key essay on moral markets, references Freeman's work on stakeholder, so there are worthwhile perspectives to consider here. Boatright sets up an opposition between Moral Managers and Moral Markets, suggesting that within a moral market model, 'the ideal business relation is not an open-ended relationship but a fully-defined contractual relation' (Boatright, 1999: 588). For Boatright, writing in the late 1990s, 'completely planned business relations are not possible for many reasons', listing 'the complexity of business situations, incomplete knowledge, and uncertainty about the future' as prime reasons for the impossibility of capturing business relations within a fully-defined contract (Boatright, 1999: 588). Boatright's interests in contractual obligation as a means of securing regulation and fair exchange at the level of implementation, enabled him to do away with the problems of having to negotiate personal relationships in order to achieve these ends. As such, his works reflects Rawls' principles of justice that allow for differentiated equality within an overarching framework of liberal fairness, and at the same time clearly resonates with contemporary developments in blockchain-based smart

contracting. In Boatright's view, the reliance on system-level codes of ethics - an impersonal governance layer that can be implemented via precise contracting - would be preferable to a 'communitarian' model, that would be open to failure, or at the very least, malfunction and abuse.

Clearly, there are wider conflicts between Boatright's work on moral markets and both Freeman's stakeholder theory and the principles of participatory design that Gregory discusses, most notably in how Boatright would see no place for negotiation within the corporate environment, simply the design of precise contractual relationships. Nevertheless, it is worth noting how blockchain's capacity to capture stakeholder relations within a smart contract framework has facilitated considerable development within a stakeholder view of business. What this article has shown is that ownership of data, and the way in which this information is used by streaming platforms is going to continue to be an ongoing subject of debate and development across the digital music economy. As blockchain technology becomes increasingly understood and more widely adopted, it may be that a new phase of digital disruption emerges; one in which the problematic nature of data-mining-enabled, hybrid digital music artefacts is recognised, and new models of wealth creation are developed.

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